Module 2 - To Err is Human

ME3023 - Measurements in Mechanical Systems

June 02, 2020

Topic 5 - Errors and Uncertainty

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- Types of Errors
- Sources of Errors
- Uncertainty Interval
- Error Mitigation

Parameter design plan

Parameter Design Plan: Determine the test objective and identify the process variables and parameters and a means for their control.

Ask: What question am I trying to answer? What needs to be measured? What variables and parameters will affect my results?

Text: Theory and Design of Mech. Meas.

System and tolerance design plan

System and Tolerance Design Plan: Select a measurement technique, equipment, and test procedure based on some preconceived tolerance limits for error.

Ask: In what ways can I do the measurement and how good do the results need to be to answer my question?

Text: Theory and Design of Mech. Meas.

Data reduction design plan

Data Reduction Design Plan: Plan how to analyze, present, and use the anticipated data.

Ask: How will I interpret the resulting data? How will I use the data to answer my question? How good is my answer? Does my answer make sense?

Text: Theory and Design of Mech. Meas.

Experimental Design Strategies

- Randomized Tests
- Repetition and Replication.
- Concomitant Methods